Bias and Calibration Working Group (BCWG)

Definition of Tasks

In late 1990s the styles of GPS receiver tracking began to diverge from the type seen in the IGS earlier. Because different observables are subject to different satellite biases, it was necessary to adopt procedures to avoid mixing effects, which can degrade the IGS products. First biases which have been monitored are the P1-P2 and P1-C1 (DCB) satellite-based biases.

These activities are now expected to grow significantly with the modernization of GPS and GLONASS and the upcoming Galileo system. To ensure a high quality, reliable service, a working group, where the workload is distributed among several members, is the best form to scope with all the challenging problems.

The main tasks for the working group (WG) shall be:

- near-term activities:
  - provide immediate updates of the current array of receiver types in the file p1c1bias.hist (or equivalent)
  - provide immediate updates of the current and future (P1-C1) biases in the file p1c1bias.hist (or equivalent)
  - provide any updates that might be needed to user software to account for the biases (cc2noncc.f or equivalent)
  - begin work to provide biases for the new (P2-C2) biases that apply for the new L2C signal available on IIR-M satellites

- reprocessing:
  - provide updated consistent over history values for reprocessing
  - provide updated consistent (P1-C1) biases since 1994.0 for reprocessing (in cooperation with the reprocessing activity)

- general topics:
  - work with BIPM to develop techniques for calibration of hardware timing delays in GNSS receiver equipment
  - consider whether the datum for IGS biases should continue to be based on a satellite constellation average of zero or whether an absolute scale would be better (in cooperation with the Ionosphere WG)
  - GPS/Galileo/GLONASS time biases
  - classification of receiver types related to the various biases which have to be corrected (tracking of the receiver developments and recommendations for observables to be provided by geodetic receivers)
  - consider how to deal with the future inter-modulation, inter-frequency biases that will likely arise from Galileo and modernized GPS signals
    - GPS (C1A,P1,P2,L2C,M,L5)
    - Galileo (E1-L1-E2,E5a,E5b,E6)
  - monitoring of DCB (Differential Code Bias) values for P1-P2 (or other combinations in future) in cooperation with the Ionosphere WG
    - satellite DCBs
    - receiver DCBs (needed for ionospheric products and interesting for correction of higher order ionospheric effects)
  - study whether receiver-based biases should also be monitored and compensated for in IGS products
  - study biases specific to GLONASS (which are crucial for ambiguity resolution)
  - potential quarter-cycle biases between different phase observables (specifically L2P and L2C) are another issue to be dealt with

It has to clarified which biases will affect positioning, timing and ionospheric estimates, respectively.

The activities of the BCWG will affect IGS clock and ionosphere products, so a close cooperation between the working groups is necessary.

WG Membership:

Chair
A representative from each Analysis Center
Any others who contribute to the success of the WG

Ex officio:

Chair of the Clock Products WG
Chair of the Ionosphere WG
Chair of the Reprocessing WG
Chair of the GNSS WG
Analysis Coordinator
Network Coordinator
Representative of the BIPM